Move with the SUN



GSMA Green Power for Mobile Working Group

25-26 September 2013 - Jakarta, Indonesia

IFC International Finance Corporation
GSMA Green Power for Mobile
In partnership with the Netherlands

ALTA Energy Green Power Solutions

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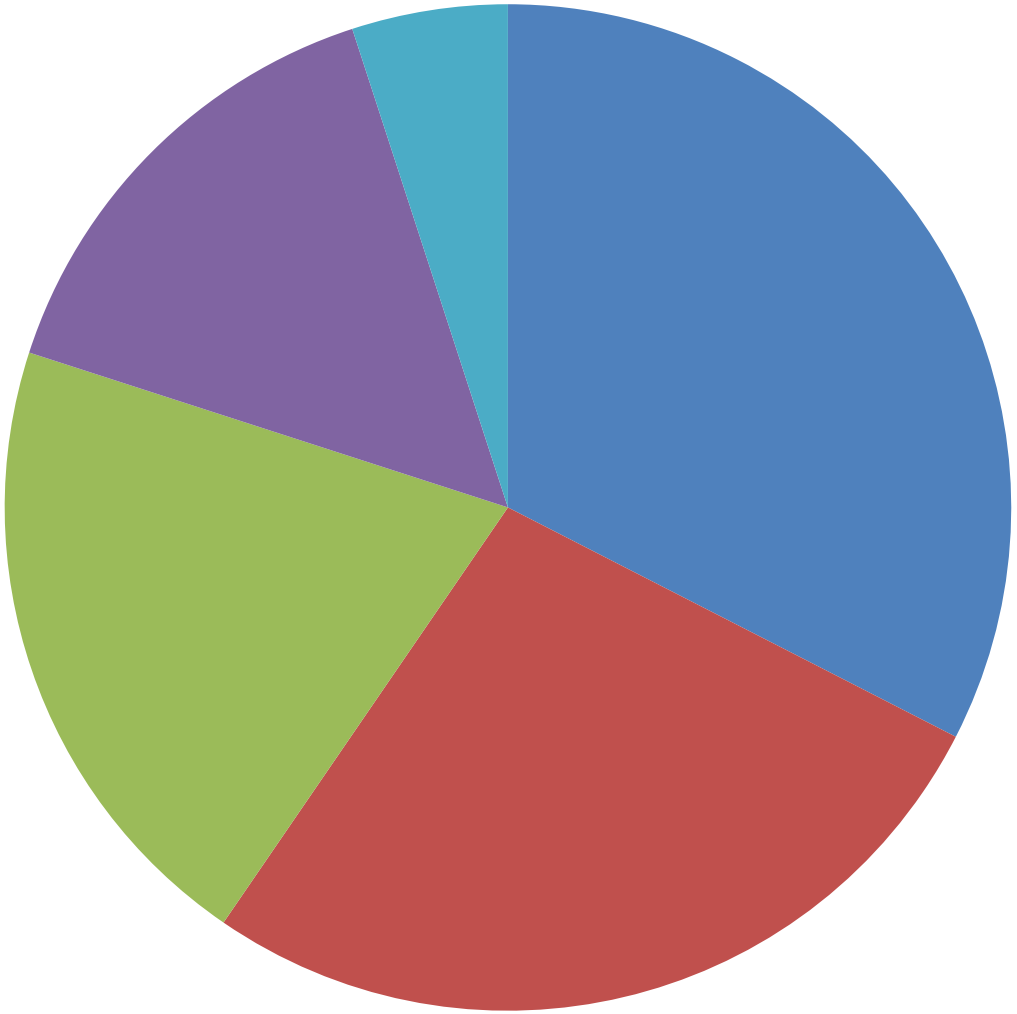
Present Status

- **Teaming up with RESCOs to offer Opex model**
- **Exploring 10 year contract with monthly fixed rate to mobile operator**
- **Developing strategic partnership with Telecom infrastructure provider**



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Cost breakdown - Solar/Grid /Battery – poor -grid site



- Battery - 33%
- Controller - 27%
- Solar panels - 20%
- Installation steelstructure - 15%
- Remote monitoring system - 5%

Reducing Opex with remote monitoring system

Why remote monitoring :

- **Reduce on-site visits**
- **Receive and direct alarms to service personnel**
- **Generate reports and analyze performance**

What can be monitored remotely:

- **Grid power**
- **Energy consumption**
- **Status of diesel generator and fuel tank**
- **Battery cycling parameters**
- **Solar panels output**
- **Wind turbines output**
- **FCU and air-conditioning**
- **Temperature & Humidity**

Strategic partners for battery storage systems

Advanced hybrid VRLA



NED

AGM VRLA



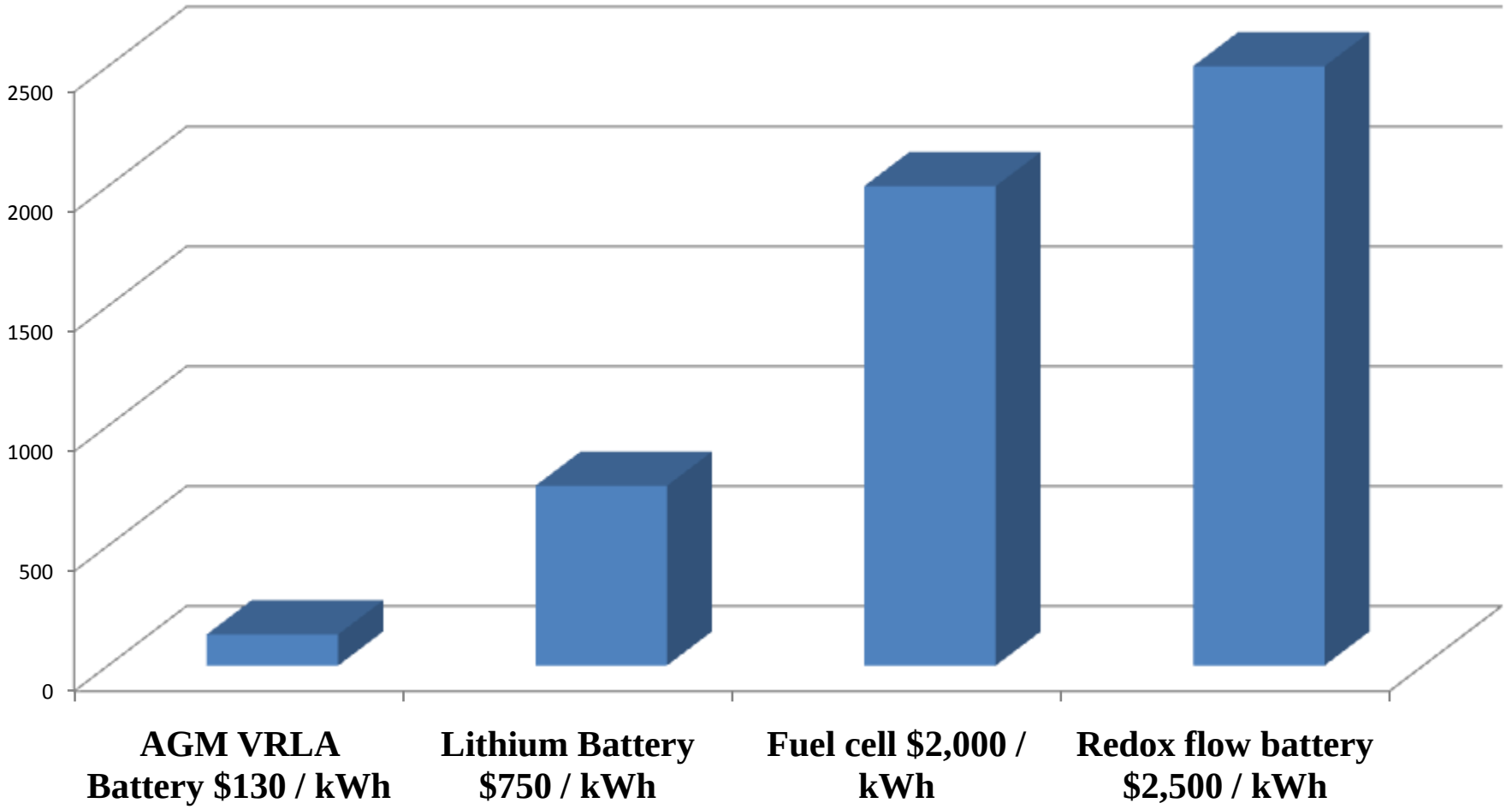
AmaraRaja

Lithium ion



SK Mobile Energy

Storage system cost per kWh



Solar/Grid/Battery system – Poor grid sites
Solar - 5hrs, Grid -12hrs, Battery - 7hrs – Opex savings ~ 80%

Solar Panel



Battery Bank



Grid



IP 55 Cabinet

Main controller

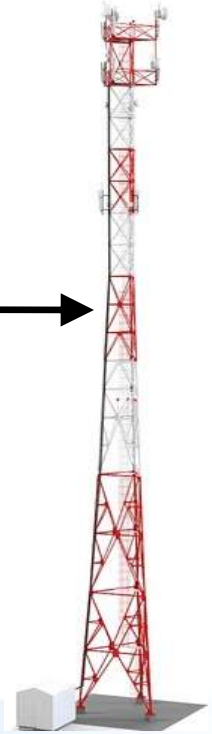
MPPT

DC bus bar

Rectifier

Remote monitoring system

BTS



Patent pending: 2832/CHE/2011

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Monthly true cost – Grid/Battery/DG Vs Solar/Grid/battery

Before

DG Run Time per day	9	Hours
Grid supply per day	12	Hours
Battery run time per day	3	Hours
Diesel consumption per year	5,913	Liters
15kVa DG consumption per hour	1.8	liters
Grid cost per kWh	0.12	$
DG maintenance cost per hour	0.21	$
Diesel cost per litre	0.8	$
Diesel transportation cost per liter	0.04	$
Battery cost per month (48V 300Ah)	47	$
Monthly Power Consumption	730	kWh

Existing Opex

Diesel cost	Diesel Transport cost	DG maint. cost	Grid cost to power BTS	Grid cost to Charge Battery	Battery cost	Opex / month	Opex / year	cost / kWh
$	$	$	$	$	$	$	$	$
415	21	58	54	14	47	609	7,313	0.8

After

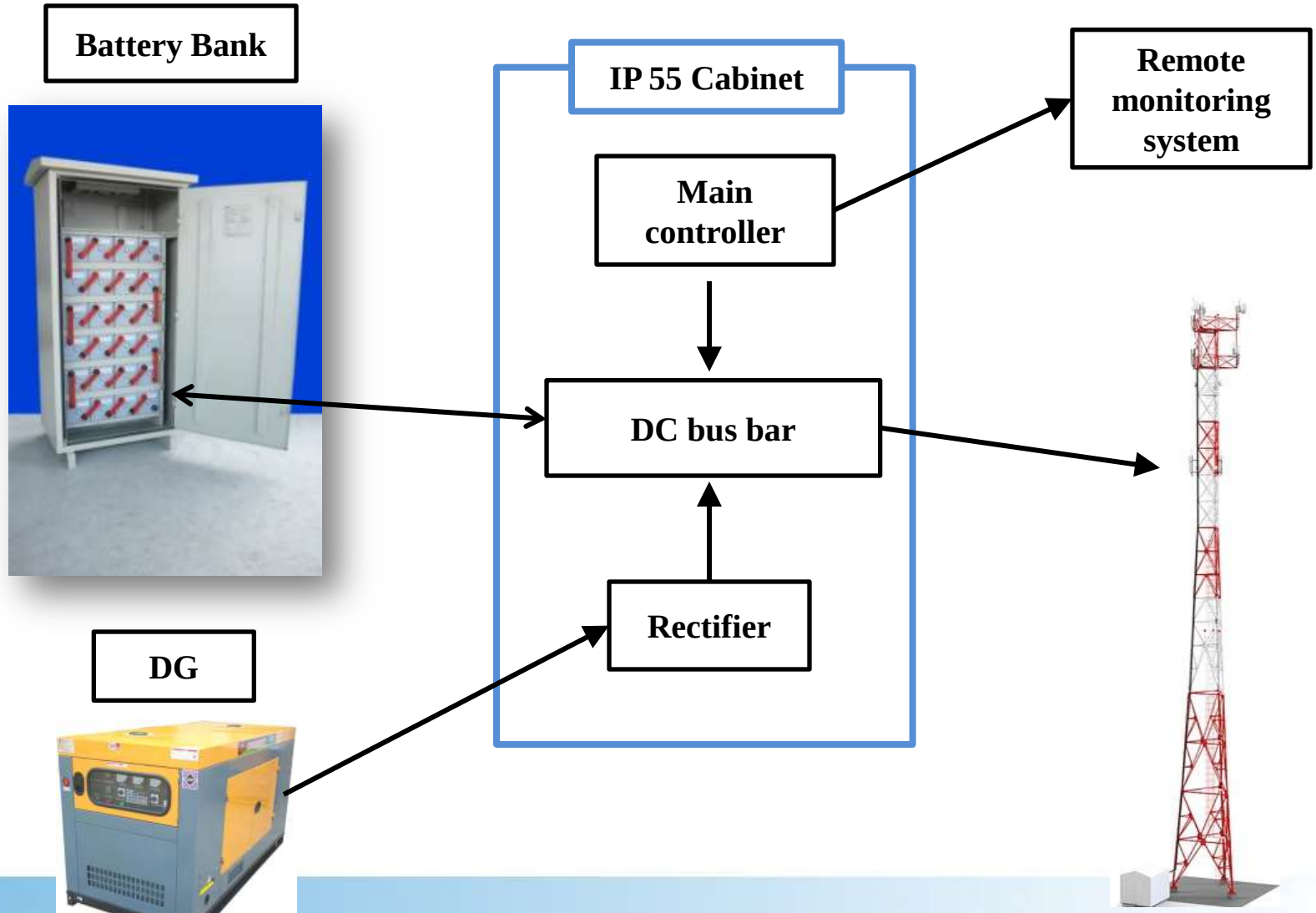
Solar Power per day	5	Hours
Grid supply per day	12	Hours
Battery run time per day	7	Hours
Grid cost per kWh	0.12	$
Battery cost / month (48V 600Ah)	38	$
Monthly Power Requirements	730	kWh

Solar/Grid Opex

Panel cleaning cost	Grid cost to power BTS	Grid cost to charge Battery	Battery cost	Opex / month	Opex / year	cost / kWh
$	$	$	$	$	$	$
10	45	32	38	125	1,503	0.2

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Battery/DG hybrid power system – outdoor BTS - off-grid sites
Battery -16 hours, DG - 8 hours - Opex savings ~60%



Patent pending: 2832/CHE/2011

Solar/Battery/DG power system – Outdoor BTS - off-grid sites
Solar - 5hrs , Battery - 18hrs, DG - 1hr –Opex savings ~ 90%

Solar Panel



Battery Bank



DG



IP 55 Cabinet

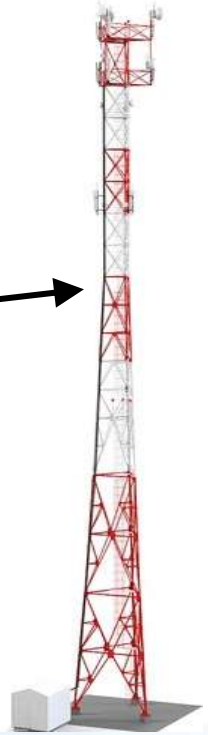
Main controller

MPPT

DC bus bar

Rectifier

Remote monitoring system



Patent pending: 2832/CHE/2011

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Autonomous solar power system –Outdoor BTS- off-grid sites
Solar - 6 hrs, Battery – 18 hrs – Opex savings ~ 95%



Solar Panel



Battery Bank

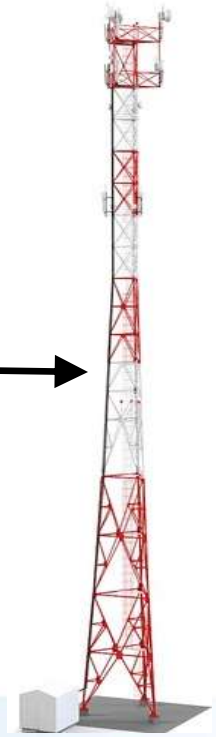
IP 55 Cabinet

Main controller

Remote monitoring system

MPPT

DC bus bar



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Thank You

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